

REMARKS

Claims 29-30 and 33-47 are pending in this application. By this Amendment, claims 29, 44 and 47 are amended.

I. Claim Amendments

By this Amendment, claims 29 and 47 are amended to further clarify that the plasma suppression means is located behind the laser head in the welding direction. Prior claim 47 recited that the plasma suppression means supplied gas to impinge the component surface at an angle of 30° to 60° and adjacent to the laser beam impingement point, wherein the impingement point "lies behind the laser beam impingement point in the welding direction." Additionally, both prior claims 29 and 47 recited that the gas extraction means was "diametrically opposite the plasma supply means." Also see, for example, Fig. 2. No new matter is added.

II. Claim Rejections

The Office Action rejects claim 44 under 35 U.S.C. §112, second paragraph, as indefinite. By this Amendment, claim 44 is amended to overcome the rejection. Applicants respectfully request withdrawal of the rejection.

The Office Action rejects claims 29, 33-42 and 46 under 35 U.S.C. §103(a) over Japanese Patent Publication No. 60-49887 to Niwa et al. (Niwa) in view of Japanese Patent Publication No. 08-238587 to Soga et al. (Soga); rejects claims 30, 44 and 47 under 35 U.S.C. §103(a) over Niwa in view of Soga further in view of Japanese Patent Publication No. 2000-253276 to Aoyama; and rejects claims 43 and 45 under 35 U.S.C. §103(a) over Niwa in view of Soga further in view of Aoyama further in view of Japanese Patent Publication No. 59-223191 to Suzuki et al. (Suzuki). Applicants respectfully traverse the rejections.

Niwa discloses a vertical laser nozzle 18, an ejection nozzle 26 disposed alongside the laser nozzle 18, the nozzle 26 ejecting assist gas 28, and a nozzle 30 to remove the assist gases 22 (from the laser nozzle 18) and 28.

Fig. 2 of Niwa shows a front view of Niwa's system in operation. That is, the weld direction is perpendicular to the plane of Fig. 2, coming out of the page. Thus, the assist gas 28 is ejected across the laser beam perpendicular to the welding direction.

Thus, Niwa fails to disclose either 1) a plasma suppression means located behind the laser head in the welding direction or 2) gas extraction means in front of the laser head in the welding direction (e.g., diametrically opposite to the plasma suppression means).

Soga teaches that the plasma generated at the time of laser welding may be removed by spraying Argon gas (called side gas) into the weld zone from a side nozzle 2. As Soga's name for it states, side nozzle 2 is located to the side of head 1 relative to the weld direction. The side nozzle 2 is articulated and movable so that the angle, height etc., of the side nozzle may be changed. Soga fails to disclose use of a suction or extraction nozzle that the nozzle 2 may be moved to spray gas onto the weld zone from behind the weld head relative to the direction of welding movement. In the variations discussed in Soga, the gas nozzle 2 is always referred to as a "side nozzle".

Thus, Soga fails to cure the deficiencies of Niwa. Similarly, Aoyama and Suzuki fail to cure the deficiencies of Niwa.

For the foregoing reasons, Applicants respectfully request withdrawal of the rejections.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 29-30 and 33-47 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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